AGRICULTURAL NEWS LETTER

VOL. 24 - NO. 5 SEPTEMBER-OCTOBER, 1956

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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AGRICULTURAL NEWS LETTER

Published bi-monthly by the
Extension Division, Public Relations Department
E. I. DU PONT DE NEMOURS & COMPANY (INC.)
Wilmington 98, Delaware

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PARTNERS IN PROGRESS

An Editorial

The title of this piece is the 1956 slogan for Farm-City Week (November 16-22) -- the second annual week-long program devoted to promoting better understanding, and pointing out the interdependence that exists between farm and city people in our modern economy.

When this subject of progress, as applied to farming practices, is mentioned, I sometimes recall the whimsical comment of a dairyman in my home county. Asked why he hadn't attended an extension service meeting on new and better methods of preserving forage crops, he said, "Shucks, I'm not farming now half as well as I know how!"

Progress on the farm, and in the factory, has been a dynamic force. It has caught us many times in the past quarter-century with the swift realization that the way we were doing things was not entirely up to date. As we strive to accomplish our agricultural or business goals more efficiently, farmers and city dwellers often find themselves, to paraphrase the Farm-City Week slogan, "partners in trying to keep up with progress."

Not all tomato growers can qualify for the 25-ton club. But then, it wasn't long ago that the goal with this crop was the 10-ton club -- a production-per-acre mark that is so common today it draws little comment.

Those higher yields, be they in tons of tomatoes or pounds of beef, are the means of lowering farm production costs and boosting net returns. They can only result from taking advantage of improved farming practices, more efficient implements, and other modern scientific aids to agriculture which have been developed by our American technology.

During Farm-City Week, when farmers and their city neighbors get together to measure their "partnership in progress," let's have the foresight to hope that in the years to come we may always find a stockpile of such new developments ahead of us, awaiting our evaluation and adoption.

This isn't a frustrating situation, but a very reassuring one. It means that technical advances from our laboratories and experimental stations are keeping our heads well above water in the river of our dynamic American economy. It means that we have more challenging frontiers of progress to push into, and that we can look forward to a better life and a better living in each succeeding generation, whether our job is raising food for the supermarket in town, or building improved farm implements and making safer and better farm chemicals for the man on the rural route.

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DuPont's Stine Laboratory buildings, Newark, Del., where poultry feeding experiments described here have been conducted.

NEW INFORMATION ON PROTEIN NUTRITION FOR POULTRY

A new aspect of protein nutrition for poultry was recently added to nutritional science with the completion of a series of chicken feeding experiments at Du Pont's Stine Laboratory in Newark, Del. Results of these experiments show that productive energy (calorie) content of poultry feed governs the relationship between protein content and methionine requirement. This work supplements the practical implications of the "methionine-energy" concept discovered by Du Pont nutritionists and reported in the "Agricultural News Letter" for July-August, 1955.

In addition to the Stine Laboratory work, Du Pont has conducted a series of field trials under practical broiler-raising conditions on a farm near Lancaster, Pa. Significance of these trials to feed formulators and broiler growers is reviewed in a summary of the results -- also published recently.

By applying the knowledge gained from this program of Du Pont research, the feed formulator and broiler grower can maintain a high level of performance without excessive protein cost.

The first report from Stine Laboratory showed that the methionine requirement of a growing chicken, expressed as a per cent of the diet, increases as the energy content of the feed is increased. However, this experimental work was conducted with rations that maintained a constant level of about 21 per cent protein.

It has long been known that when total protein level is increased, under certain conditions, the methionine supple-

mentation must be increased to keep this amino acid in balance with the others. So the second series of Stine Laboratory experiments introduced a protein range of 20 to 28 per cent for two different energy levels. In one group of rations, the calorie content was low enough to limit utilization of available protein for tissue synthesis. In the other group, the calorie level was high enough so that energy content was not a limiting factor in protein utilization. It was only in the second group of rations that methionine produced a response proportionate to the increase in protein.

In Du Pont feeding trials at Lancaster, Pa., birds are weighed at intervals during the test period, and a final weight is recorded as the birds are loaded on the trucks.

From a practical standpoint, these findings show that if methionine is the only inadequate amino acid in a high energy ration, the energy level can be maintained and performance improved by fortifying the ration with methionine alone, rather than going to the expense of increasing total protein. Furthermore, if the feed does not contain enough calories, an increase in protein content will be wasted. If calorie content is adequate for utilization of more protein, raising the protein level may result in a bigger proportional deficiency of methionine. If methionine is not added to this ration, the higher protein ration will be less efficient than one containing a lower level of properly balanced protein.

The flexibility of feed formulation provided by proper use of methionine in relation to calories and other amino acids is confirmed by the series of field trials at Lancaster. Four of these trials are considered to be significant.

The first confirms the Stine Laboratory findings that feeds of similar nutrient composition but with different energy content require different amounts of added methionine. The second demonstrates how methionine can be used to help balance protein level with productive energy. The third shows how performance of chicks is influenced by the supply of specific amino acids. The fourth shows how methionine can be used in feed formulation to help reduce costs of finishing broilers.

To obtain a summary of these four Du Pont field trials, write to the editor of "Agricultural News Letter," Public Relations Department, E. I. du Pont de Nemours and Company (Inc.), Wilmington, 98, Del.

NYLON CUSHIONS FALLING OLIVES IN CALIFORNIA HARVESTING TEST

An improved mechanical tree shaker, and a nylon-covered catching frame around the foot of the tree -- these are the new pieces of olive-harvesting equipment being tested by agricultural engineers on the Davis campus of the University of California.

These photos show two views of the nylon-covered olive-catching frame, half unfolded as it encircles a tree. Note in the lower photo the sections of aircraft innertube which fit tightly against the tree trunk and close the gap between frame and tree.

The shaker will remove an average of 93 per cent of the fruit from a tree, and enables the harvesting and collecting of the crop with just about half the man-hours required by conventional methods, according to tests conducted by Lloyd H. Lamouria of the University.

The tests were first conducted with a canvas-covered frame around the tree. Nylon is now being used, according to Professor Lamouria, because it has more resilience. An olive dropping onto canvas is decelerated much more abruptly, with consequent bruising, than one dropping on nylon.

A highly mechanized operation, both shaker and catching frame are mounted on tractors, so they can be moved rapidly from tree to tree. A double-acting, rigid, boom-type shaker was used in last year's tests,

operating with a 4.5-inch stroke at a frequency of 400 to 1150 strokes per minute. A rubber-covered jaw with a 30-degree swivel significantly reduced limb injury as compared with the conventional fixed jaw. The catching frame unfolds to surround the tree. At its base, air inflated sections of an aircraft innertube close any gap between frame and tree, regardless of the size of tree.

Before mechanical olive harvesting is completely practical, Professor Lamouria stresses, further studies are needed on labor-saving techniques, such as the use of catching frames and pick-up machines, as well as pruning systems which might adapt the size of the tree to a catching frame of reasonable size.

# # # # #

NEW HUMANE LIVESTOCK STUNNING INSTRUMENT USES POWDER CHARGE

A more humane and efficient device for the slaughter of livestock in packing plants has been developed by Remington Arms Co., Inc., and is being given industry-wide tests under sponsorship of a joint committee of the American Meat Institute and the American Humane Association.

The new instrument, which may replace the old stunning hammer in the meat packing industry, was developed by Remington with the advice and assistance of John C. Macfarlane, director of the livestock conservation department of the Massachusetts Society for the Prevention of Cruelty to Animals.

It employs a mushroom-shaped head, activiated by a specially designed 22-caliber blank cartridge. Resembling a polo mallet, the tool is tapped lightly against the animal's forehead. A protruding trigger fires the charge, which sends a captive cylinder forward, powered by expanding gases. The animal is stunned instantly, without needless injury.

The Massachusetts' humane organization has awarded Remington a silver plaque for its achievement, and the American Society for the Prevention of Cruelty to Animals has presented the company with its James Hopkins Award for research into the field of humane food animal slaughter.

* *
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* TRACTOR TROUBLES *
*
* It takes enough air to fill a 100-ton silo to burn *
* five gallons of gas in a tractor engine. That's why so simple *
* a matter as a clogged air cleaner can increase fuel consump- *
* tion and cause other engine troubles, according to a folder on *
* tractor care published recently by Du Pont's Petroleum Chemi- *
* cals Division. Besides air cleaner troubles, improperly ad- *
* justed carburetors, faulty ignition systems, and fouled cool- *
* ing systems are the most frequent cause of poor tractor opera- *
* tion, it states. *
* *

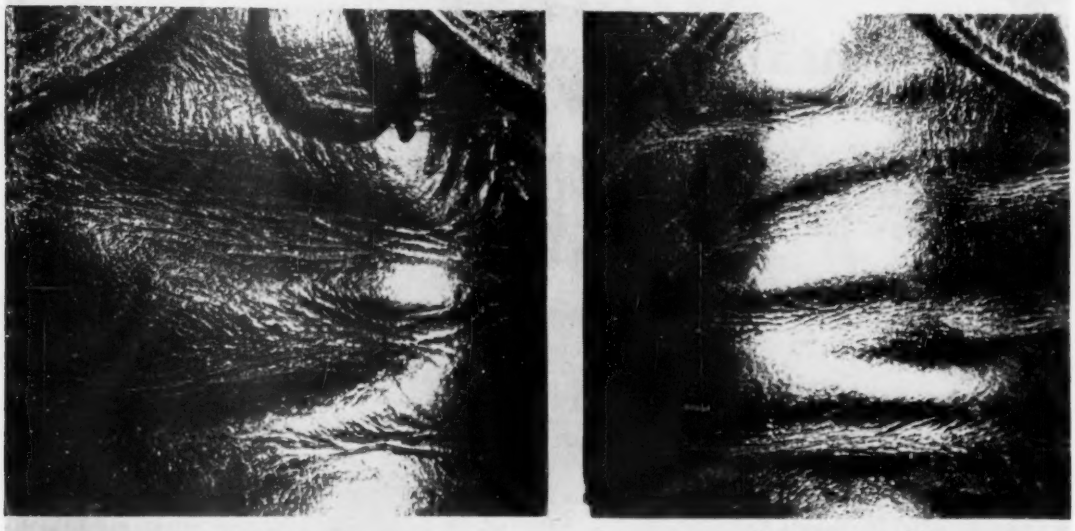
TOUGHER LEATHER FOR WORK SHOES

MADE BY NEW CHEMICAL TREATMENT

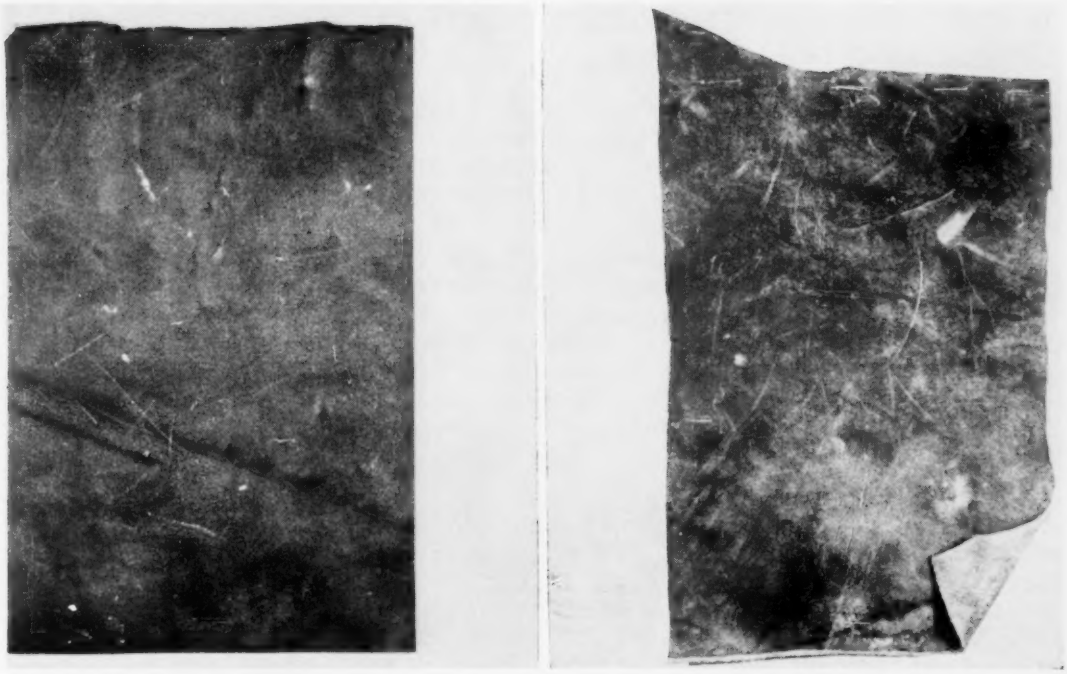
You can slog around a wet barnyard day after day, and your shoes will stay strong and supple, if the leather was treated with "Quilon" chrome complex during the tanning process. Furthermore, your shoes will wear longer, keep their shape better, and have superior resistance to water, perspiration, manure, and the chemicals commonly used in cleaning dairy utensils or disinfecting poultry houses.

"Quilon," a product of Du Pont research, has been used successfully as a water repellent for paper, textiles, and felt hats, and more recently to make sheepskin suede water repellent and dry cleanable. Last year Du Pont research men began experiments to see if "Quilon" would impart water resistance to side leather for shoe uppers.

It did. In addition, the treated leathers showed a tighter grain structure than that tanned by conventional methods, with the result that shoes kept their shape longer and wore better. Standard finishes adhered better to the treated leather, and it stayed polished longer. The treatment did not interfere in any



These enlarged photos show vamp areas of test shoes. The one at left was made from leather processed in the conventional manner. The one at right was made from leather treated with "Quilon" chrome complex. Both shoes received identical wear. Note tighter grain structure of the treated leather, which enables the shoe to keep its good appearance longer, retain its shape, and resist effects of water, chemicals, and perspiration.



These two pieces of leather were placed in a dairy barn for eight days, where they were exposed continuously to manure and urine. In addition, the farmer doused each swatch with milk periodically. The leather processed with "Quilon" chrome complex at left, still looks and feels like good leather while the other piece, processed in the conventional method used with shoe leather resembles a piece of wood.

way with the ability of the leather to breathe, an important factor in shoe comfort.

Leather treated with "Quilon" remained supple after exposure to laboratory perspiration tests, and then withstood eight million flexings without cracking. Samples of ordinary leather were so brittle they cracked at the first flexing after the same exposure.

Similarly treated leather experimentally buried in manure piles and splashed with milk far outperformed untreated leather. In fact, leather treated with "Quilon" chrome complex was damaged only slightly by contact with the strongest chemicals. For example, contact with hydrochloric acid for ten minutes burned a hole through a sample of conventional leather, but marred a swatch treated with "Quilon" only slightly.

"Quilon" cannot be applied to finished shoes, but must be applied to the leather during the final stages of the tanning process. A number of manufacturers are now offering work shoes made of treated leather.

"CERESAN" SEED DISINFECTANTS
NOW AVAILABLE IN LIQUID FORM

More complete liquid seed treatment is now possible with new additions to the family of "Ceresan" seed disinfectants. The new formulations round out a line of chemicals which has been a byword among growers of small grains and cotton for more than a quarter-century.

"Ceresan" was the first material to offer farmers the advantages of an organic mercury to protect seed against seed-borne and soil-borne organisms. The new formulations retain both the fumigating and residual action of the dry mercury compounds and in addition offer the convenience of liquid and the safety factor of a dye which colors the treated seed. The new materials also have little or no tendency to corrode machinery or cause skin irritation.

The new treatment is based on a blend of two highly effective organic mercury compounds to provide disinfecting vapor and long residual action. This combination is formulated in different concentrations to provide convenience of use in different types of slurry and liquid seed treating equipment. With these, plus the dry formulations of "Ceresan" already on the market, Du Pont offers an organic mercury seed disinfectant for use wherever one is recommended, in all common types of treating equipment.

These products have been studied in greenhouse and field trials for several years. They are recommended for use on wheat, rye, barley, oats, and flax, and all types of cotton seed.

"Ceresan" seed disinfectants control covered smut, black loose smut, and stripe of barley; oat smuts; stem and covered smuts of rye; stinking smut or bunt of wheat; and reduce infections from surface seed-borne anthracnose and angular leafspot of cotton. They improve stands by preventing seed rot and by reducing seedling blights caused by seed-borne and soil-borne organisms.

The new products are packed in containers of five, 30, and 55 gallons.

# # # # #

TOLERANCES -- NOT A MEASURE OF TOXICITY -- "In addition to the toxicity of the chemical there is the question of the amount of residue that would normally remain when good application practices are followed. If only a small amount of a chemical is needed for effective pest control, and it dissipates rapidly, there is no need for as large a tolerance as there would be if the persistence of the chemical were greater. Both the toxicity and the quantity remaining under good pest control practice are considered in establishing a tolerance." -- Allen B. Lemmon, chief of bureau of chemistry, California State Department of Agriculture, in an article in "Western Grower and Shipper."

THE FREE MARKET ECONOMY

by Harold Brayman
Director of Public Relations
Du Pont Company

Editor's Note: The following is excerpted from a recent talk by Mr. Brayman before the Chamber of Commerce of the United States. No place has the clash between these two philosophies -- government control versus the freedom of the market place -- been more pronounced than in economics applied to American agriculture over the past 35 years. While Mr. Brayman does not stress the farm situation, many of his examples may be equally applicable to agriculture. Full text of the talk is available on request.

If we go back over the years, we will find that there has been one persistent appeal on behalf of destruction of the free market. That has been that it is to your interest -- you the people -- to support this change or that change which would place the control of our economy in the hands of government as the representative of the people.

When the advocates of control wanted prices fixed, they told people it was in their interest to have prices fixed and keep them low. Of course they didn't mention that, when you fix the price of an article at or below the cost of production, you don't get any production and you go without the article. But the point is that the appeal here was to the personal interest of the individual.

When the advocates of control wanted to build huge projects out of tax money for the benefit of a special geographical group, they told those people that they would, for example, be able to sell power cheaper than private companies could. And they tried to spread the local geographical interest to a national interest by telling people that this would provide a "yardstick" which would force cheaper power all over the nation. Again, an appeal to personal interest.

When the advocates of control tried to socialize medicine, they told the people this would mean "free" or at least much cheaper service from doctors and hospitals. They also tried to convince the doctors that compulsory health insurance would mean prompt payment by the government of every patient's bill. This double-barreled appeal to self-interest failed because the doctors preferred freedom from bureaucratic red tape, and the people preferred the freedom to choose their own physicians -- a more powerful form of self-interest.

In the field of housing, the advocates of control proposed to continue indefinitely the wartime ceilings on rent. This was an attractive proposition to tenants until they discovered

that landlords were no longer able nor willing to pay for repairs and renovation, and that builders insisted upon some assurance of reasonable return on investment before they would undertake to construct additional homes to meet the housing shortage.

The advocates of control tell gas consumers the price of fuel would be less if government determined the rates at which gas is sold to distributors. They say small businesses would have a better chance to grow if businesses which have become large are broken up. Their bait of self-interest is always dangled before the groups in our society which have the largest number of votes.

The point in all the illustrations I have given you is that the proponents of government control constantly seek to sell their viewpoint by appealing to the personal financial interest of the individual by telling him that their way is better for him.

The only way we can effectively meet that type of propaganda and preserve the free market economy which has made this nation great is by persuading people that it is in their long-term interest to keep the free market economy, no matter how much various pressure groups might gain temporarily by destroying it.

And what do the facts show? They show first and foremost that the greatest force for social and economic progress that we have is the development of our technology. And what causes that technology to develop? It is the free market economy -- the desire for profit.

And what kills that development? You all know it is the loss of the profit incentive, whether that loss is caused by lack of a free market, or by excessive taxation on profit.

There is nothing inconsistent here with the public welfare, because the way to profits has always been through filling human needs. This is true whether applied to the humblest employee or the biggest industrialist. The employee profits as he increases his skills and better tools are made available so that he can do more difficult things, and the corporation profits when it provides goods or services that are in high demand.

The effectiveness of this force of technological development for human progress, both social and economic, has a high public visibility if we will just direct attention that way.

Anybody can see it; everybody can understand it.

It wasn't political agitation that has extended the average person's life expectancy in America from 49 years to 68 years since 1900. This additional two decades for every person was the result of improved technology of medicine, a combined product of the medical profession and industrial and medical research. It was the ability, for example, to work out ways of making penicillin cheaply. It was the development of the other

antibiotics and many kindred improvements in medical diagnosis and care, a large portion of which emanated from industrial research.

It was not a cry for political help for the farmers which, over the last hundred years, has improved agricultural life so greatly. It was the invention of mechanical and labor-saving machinery; industrial enterprise which enables one man today to produce as much food as many did a century ago, so much so that the surplus he produces is now a problem.

The eight-hour day and the five-day week did not come because people desired them. They came because the means of production were so greatly improved that human demands for goods could be met on a 40-hour week.

In modern times, the automobile, a product of industry, has widened and enriched lives in a manner impossible to achieve through any controlled economy, for the people cannot have what the people do not produce.

In every city in this country, a movement of profound social significance is now under way. A movement from city dwelling to suburban dwelling. This is bringing about the replacement of city alleys as a place for the rearing of our children by trim green lawns and good gardens, and the basis for that reform is the transportation provided by the automobile in the ownership of the many. And conversely, our families who live in the rural areas are no longer isolated from the cultural and recreational pursuits of the city.

Nor have these developments been restricted to economic advance. The high degree of general universal education in this country is by no means unrelated to the productivity of America which is so great that it is no longer necessary for children to go to work at an early age to help earn the food that they eat.

I have cited four examples: the extension of human life, agricultural development, education, and the wide sociological effects of cheap universal transportation. But I might have cited dozens if time permitted, for the same principles have been at work in every field that has been touched by advancing technology.

This is the way our standard of living has advanced. This is the way our cultural, educational, and social developments have come about. Nearly every improvement contributing to these developments has been made possible by our industrial progress. We have, in this country, brought the benefits of that progress to every home. Our venturing, risk-taking economy has brought an economic advance to our people which is the envy of socialists the world over.

The contrast between the two systems is very clear. The socialists set as their objective the establishment of such controls that no man shall be rich; the free economists set as their objective the development of such initiative that no man shall be poor.

CATTLE TREAT THEMSELVES

WITH NEW "WORMER" FEEDS

Unique among new products for improving livestock production are the therapeutic phenothiazine feed formulas that make it possible for cattle and sheep to "worm" themselves. These "wormers" provide a sufficient quantity of phenothiazine, in the right amount of feed, to eliminate an internal parasitic infection in one to three days' feeding. They are the first curative medicated feeds developed for ruminants, although similar therapeutic formulas have long been used for poultry and hogs.

Phenothiazine has been included in ruminant rations at low levels (to provide approximately two grams of the drug per head per day) for several years. But until the development of therapeutic feed formulas, the spring and fall curative doses of two ounces per animal could be administered only by drench, bolus, or other means requiring individual handling.

The new "wormers" containing phenothiazine mixed with feed permit quick de-worming of cattle at the beginning of the feeding period before they reach full feed intake, enabling them to make better gains in the feed-lot. Furthermore, the job is done at nominal cost without upsetting the animals.

The first feed formula containing therapeutic levels of phenothiazine was introduced commercially by a Texas firm about three years ago. Now several manufacturers are offering such rations.

Development of therapeutic feeding of phenothiazine has come from increased recognition of the losses which internal parasites cause in cattle production. Internal worm parasite control has been found to improve gains, even in beef cattle which do not show conspicuous evidence of parasite infection.

Additional information on therapeutic feeds containing phenothiazine can be obtained from the Editor, "Agricultural News Letter."

# # # # #

FAITH AND COURAGE -- "When you get right down to fine points, the biggest factors in agriculture are the faith and courage of farmers, and it isn't likely that any government farm program will ever displace them in our system. In other systems of government, fear and slavery are substituted for faith and courage. Maybe our way doesn't guarantee security under all conditions, but it does leave room for a man to be a man and that surely is more to be desired than any other thing a government can give." -- Editor Rich Johnson in "Arizona Farmer"

INCREASING IMPORTANCE OF EDUCATION SHOWN BY STUDY

The increasing importance of higher education in this technological world in which we live, farm and work was emphasized in a recent study by the Du Pont Company which showed that one out of every seven of its employees today is a college graduate.

The number of college graduates nearly doubled in eight years -- to 14,000 -- while the total of employees went up about 15 per cent to approximately 100,000, including those at government-owned plants operated by the company. In 1947, about one employee in 10 had a college degree.

Results of the study, made simply to answer questions which turned up in the company, point up the significance of the upgrading in jobs throughout the company, for which it is difficult to develop statistics. Despite the increase in total employment, there are fewer unskilled jobs. A higher proportion of people being hired now have at least high school education. The increase in mechanization requires more craftsmen and every increase in scientists and engineers requires more research assistants and technicians.

With the over-all increase in educational attainments, the company today has a more highly educated group on which to draw for promotion. While many of the college graduates enter supervision, half or more of supervision at many plants did not go beyond high school education. Similar opportunities appear in the company's sales work. And of the company's management people, at about the plant manager level and above, about one out of seven do not have college degrees.

The increasing technical nature of Du Pont's business was confirmed more specifically by the increase in employees with degrees in the physical and biological sciences, engineering, and mathematics. In 1940, one employee in 15 had a technical degree; last year it was one in 10.

In the last few years, Du Pont employees have also been coming from more schools. More than half of the degree granting colleges and universities in the nation as well as many foreign schools are represented. This is evidently a result of the growth of the company geographically plus the technical manpower shortage.

The geographic spread of Du Pont plants in recent years has attracted students of smaller schools not previously represented in the company and has brought about an increase from some institutions which previously had only a few graduates with the company. A new plant in an area evidently attracts students from colleges in the vicinity to the company as a whole.

COTTON AND SYNTHETIC FIBERS -- A TREND IN BLENDS

The product of the cotton field and the fibers from the test tubes now team up in new fabrics which are putting cotton into types of apparel where it has never been of practical importance previously.

by Dr. Donald F. Holmes
Textile Fibers Department
E. I. du Pont de Nemours & Co., Inc.

A growing factor in the textile industry is the concept of "engineered" blends --fabrics which combine synthetic with natural fibers in such a way that the better properties of each fiber can be used to overcome the shortcomings of the components used individually. As a result, after several years of a highly competitive feeling between the natural and the newer man-made fibers, there is evolving an interdependence between them in large segments of the industry.

As can be expected in a system of free enterprise, the synthetics have in some cases reduced the market for natural fibers and yet in other cases have increased the market by placing them more importantly in certain end uses. In all cases, both the natural and the synthetic fibers are lending their specific qualities to fabrics which could be obtained no other way, and this element results in sound business growth.

U.S. MILL CONSUMPTION OF TEXTILE FIBERS
NATURAL & MAN-MADE

YEAR	COTTON		WOOL		MAN-MADE		SILK		TOTAL	%	POPULATION	PER CAPITA CONSUMPTION LBS.
	POUNDS	%	POUNDS	%	POUNDS	%	POUNDS	%	POUNDS	%		
1920	2,828,100,000	88.9	314,200,000	9.9	8,700,000	0.3	29,200,000	0.9	3,180,200,000	100	106,000,000	25.1
1924 ①	2,636,600,000	85.9	342,200,000	11.1	42,400,000	1.4	47,800,000	1.6	3,069,000,000	100	110,000,000	23.6
1927 ②	3,587,700,000	87.2	354,100,000	8.6	100,100,000	2.4	71,600,000	1.8	4,113,500,000	100	116,000,000	29.5
1929 ③	3,422,700,000	85.5	368,100,000	9.2	133,400,000	3.3	80,800,000	2.0	4,005,000,000	100	122,000,000	27.4
1940 ④	3,953,600,000	81.0	407,900,000	8.3	486,500,000	10.0	35,800,000	0.7	4,883,800,000	100	132,000,000	32.8
1955	4,386,400,000	65.7	427,100,000	6.4	1,850,600,000	27.8	7,200,000	0.1	6,671,300,000	100	165,000,000	36.5

Note the steady increase in consumption of pounds of both cotton and wool, even though their respective percentages of total fibers used have declined as use of the synthetics has increased in recent years. Population increases and higher per-capita consumption of fibers account for much of this increased need for all fibers. New blends of natural and man-made fibers are a comparitively new influence on this market, gaining popularity rapidly since they make possible fabrics with long-wear, easy-care characteristics never before known. Circled figures in the left-hand column mark these textile landmarks: (1) name of "rayon" applied to first man-made fiber to remove it from the class of artificial silk; (2) annual poundage of man-made fibers passed silk; (3) silk in its peak year of use, just two per cent of total fiber consumption; (4) first commercial year for nylon and start of the era of true synthetic fibers. (Figures obtained from Textile Economics Bureau).

Typical of this growing development is the combination of cotton with such man-made fibers as nylon, "Orlon" acrylic fiber, and "Dacron" polyester fiber. In general terms, cotton reduces cost and adds to these blends excellent appearance, hand, and washability. "Dacron," in turn, contributes unusual wrinkle resistance, retention of neat appearance, and remarkable ease of maintenance. Besides lending a measure of these same properties, "Orlon" adds a luxury touch. Nylon, finally, gives durability and strength which are translated into either longer wear life or lighter fabrics for a given job.

Of greatest immediate importance is the story of "Dacron" and cotton. This is an amazing story of expansion -- starting with nothing four years ago to millions of yards of fabric in at least 25 different end uses ranging all the way from ladies' slips, to men's suits, to fire hose.

In women's wear, "Dacron" and cotton have made an important mark in dresses, blouses, and intimate apparel. Some twelve million yards are expected to be sold this year in lawns, batistes, voiles, and sheers.

In blouses, the blend of "Dacron" and cotton is of great importance, with every major blouse manufacturer interested. In intimate apparel, such as slips, brassiers, foundation garments, and pajamas, the most important fabric is a modification of the blend in which a very desirable luster is obtained by using a warp of continuous filament "Dacron" or nylon with a filling of the blend of "Dacron" and cotton. Some nine million yards of this fabric are being produced this year.

The problems which originally beset these blends have been largely overcome through considerable trade effort. The future holds promise of still further solid growth as the currently better techniques for good coloration and control of pilling are used to expand the fabric types.

Intimate blends of "Dacron" and cotton are growing with equal rapidity in the men's wear field. In three years' time, for example, the 65 per cent to 35 per cent blend of "Dacron" and cotton has become an important and recognized fabric for medium and higher priced shirting, appearing in some eleven million units in 1956.

A somewhat heavier fabric, primarily a poplin, half of "Dacron" polyester fiber and half of cotton, has rapidly become important in better grade raincoats and jackets. An estimated two million wash and wear jackets from "Dacron" and cotton are being sold this year after a mere two years' experience in the retail store.

A newer and dramatically important use of somewhat heavier yarns of the blend of "Dacron" and cotton is in men's

suits and slacks. Cotton has come a long way from the washable seersucker to the current models of cords and pin stripes in blends with "Dacron" which present an excellent appearance in business suits. Even more important are the results of considerable spinning and weaving research which have now led to suits of the more conventional worsted type from blends of "Dacron" and cotton, forecast as a big factor in men's suits by next year.

In the industrial fields, an interesting combination of the properties of "Dacron" and cotton has built a steadily expanding use in fire hose. Fire hose depends on the filler cords for its bursting strength; so many fire companies have found that a hose with a cotton warp and filler cords of "Dacron" filament yarn is stronger, lighter, less bulky in storage, and far easier to handle. Some 7,500,000 feet of this type of municipal fire hose are being manufactured this year.

It is anticipated that similar sound growth is now at hand for blends of cotton with nylon and with "Orlon" acrylic fiber. Recent fabric development work by various organizations has brought forth a variety of blends of "Orlon" and cotton which are of immediate interest for woven sports shirts, robes, and ladies' lounge wear and pajamas.

Blends or combinations of nylon with cotton, although small in number, have been quite diverse. Millions of yards of nylon upholstery with a cotton backing are sold every year. A number of very successful lightweight dress fabrics have made use of a nylon continuous filament warp with a cotton filling to yield a beautiful appearance because of unusual luster.

The important current trend in the nylon and cotton blend, however, is in the use of nylon to reinforce traditional cotton fabrics. As an example, after a three-year wear test it has now been demonstrated that denims and twills prepared with 25 per cent nylon blended in the warp give 70 per cent longer wear life than all-cotton pants, for a net saving of 25 per cent. In several industrial applications where work gloves constitute an important item of cost, it has been demonstrated that gloves containing 50 per cent nylon in the warp lasted an average of 2.2 times as long as control cotton gloves, giving a remarkable final cost saving of 45 per cent.

Blends of synthetic fibers with cotton seem destined to live, grow, and expand the market potential because in almost every end use they make sense from functional and aesthetic points of view.

Clifford Lyons, about to enter the new air-conditioned cab he has just installed on his combine. (Courtesy of "Weekly Star Farmer")

MISSOURI FARMER TO COMBINE IN COMFORT

Clifford T. Lyons of Hale, Mo., uses a combine to harvest grain and seed crops from about 700 acres. He has just spent about $700 to install on that combine an enclosed cab and air-conditioning unit.

Anyone who thinks this is a high price to pay for coolness and cleanliness on the harvesting job is cordially invited to ride the combine for a day or two without benefit of air conditioning, before expressing any criticism.

It was freedom from dirt, more than heat, that first prompted the investment. The operation deck is right out in front on the combine, about five feet above the ground. When driving into the wind, chaff and dust from the grain, as it is fed into the threshing mechanism, fog up into the driver's face. And when there's a tailwind, chaff and straw being dropped from the rear of the machine swirl around the operator.

The combination of cab and air conditioner was necessary to lick this job which Mr. Lyons describes as "about the itchiest and dirtiest one on the farm." The cab alone would have solved the dirt problem, but would have made the heat unbearable.

Farmer Lyons figures he's made a good investment.

TIPS ON WINTER TRACTOR CARE

During cold winter months, the cooling system is the most vulnerable part of a tractor. Improper maintenance can result in a split engine block or radiator -- and a stiff repair bill.

To protect this valuable piece of machinery against damage, the following program is recommended by Du Pont cooling system experts, who developed "Zerone" and "Zerex" anti-freezes:

1. Drain and flush the radiator and engine block with a chemical cleaner. This gets rid of accumulated rust sludge which clogs up the narrow water passages, causing an overheated motor.

2. Clean the leaves, dirt, and insects out of the radiator fins to permit air to circulate freely.

3. Check the radiator and hose connections for leaks -- and see if the hoses are worn or cracked. To install new hoses, clean pipe connections and apply a thin layer of non-hardening sealing compound. Replace worn out hose clamps, or clamps that pinch the hose.

4. Inspect the thermostat to see that it is working properly.

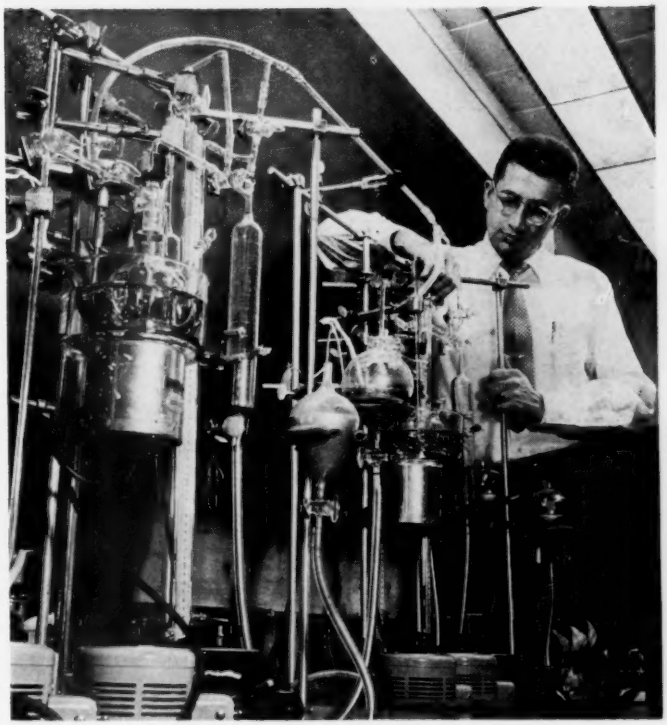
5. Replace worn or dried-out fan belts -- and tighten or straighten loose or bent fan-blades.

6. Install anti-freeze after mixing it thoroughly with water. To avoid losing any of the anti-freeze solution, in the overflow tube, pour it carefuuly from a water can with a long spout.

7. Add enough water to the cooling system to fill one half of the top radiator tank.

8. Test the anti-freeze solution with a hydrometer to make certain your tractor is protected against freezing at the lowest likely temperature in the area.

Anti-freeze time also is time to change to winter grade oil -- and to do a complete grease job. And don't forget to grease the wheel bearings.



In the industrial laboratory, theoretical reactions provided by scientists are transformed into useable new products, or into new processes by which products can be made more quickly and at a lower cost. The researcher shown here watching a chemical process taking place in his maze of glassware is Dr. John Bruce, Jr., who has been with the Du Pont Company since receiving his Ph.D. at Washington State College in 1951. Du Pont has 38 research laboratories staffed by more than 2,100 technically-trained men and women, assisted by 3,600 specialists and technicians who contribute to their research.

INDUSTRY'S SCIENTIFIC RESEARCH IN NEW PICTURE-STORY TREATMENT

"The work of science has only begun," it is pointed out in a new booklet entitled "The Story of Science in Industry," recently issued by the Du Pont Company.

"In 10,000 years of exploration, man has made notable progress, but he has discovered more questions than answers," the booklet shows.

Through 32 pages, profusely illustrated, the booklet traces the history of man's quest for knowledge, with emphasis on the ways in which research teams of modern industry are geared to pursue scientific inventions which will be of practical use in bringing us better, happier lives in the years ahead.

"Economists forsee, within 25 years, living standards in the United States that are almost twice as high as today's. They envision more leisure time, more comforts and conveniences, more abundance for all," the booklet concludes. "But they forecast merely possibilities, not certainties. Progress rests on the assumption that scientific discovery will continue apace, and that its application will increase. To make such gains realities, there must be an atmosphere conducive to science and development, one which encourages industrial organizations to assume the huge risks of finding, developing, and marketing new products."

Editor's Note: A copy of the booklet described above, latest in the "This is Du Pont" series, will be sent on request.

EXPERIMENTERS' NOTATIONS

A Round-up of Data from Across the Nation

Pelleting pine seed with "Arasan" thiram seed disinfectant and an asphalt emulsion has been found to protect the seed against birds, rabbits, shrews, and mice, in studies by the Southern Forest Experiment Station and the Fish and Wildlife Service. Treatment has resulted in stands of 5,000 to 6,000 plants per acre in direct seedings, compared to 300 to 400 when untreated seed was used. Thiram treatments are also being used to protect young trees and shrubs against rabbits.

* * * * * * *

Soil injection is a new method of brush control being tried by the Texas Agricultural Experiment Station. A soil fumigating gun or similar device is used to inject the chemical into the ground at the base of the plant. One of the herbicidal mixtures which has given good results consisted of six to eight pounds (active) of "Karmex" W monuron herbicide in 100 gallons of water. Good kill at less cost for materials is obtained since a measured dose is delivered by the fumigating gun. Species which have been killed include post and blackjack oak, elm, honey locust, and gum. Additional trials with "Karmex" herbicides and other chemicals must be made before the practice can be recommended commercially.

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At Connecticut Agricultural Experiment Station, records show that control of the potato leafhopper on alfalfa gave an average increase in yield of 25.3 per cent for the combined second and third cuttings in 1953 and 1954. Application of insecticides to forage crops is complicated by the end use of the crop, Dr. R. J. Quinton points out. Either treatments must be made when they will not contaminate the growing crop, or material which is nontoxic to animals and subsequently not present in milk must be used. Methoxychlor and heptachlor, two of the materials used in the Connecticut spray tests, have been cleared for use on forage crops by the Food and Drug Administration.

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Hexadecanol -- a chemical used in skin creams -- is being tested as a thin film spread over water storage reservoirs to cut evaporation losses. Savings might be as much as three to four feet of water a year in sections of the West and Southwest, at a cost of about $7 per acre of reservoir area. Further experimentation is necessary before recommendations are made.

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